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MISSION BAY
SUBDIVISION REGULATIONS

FOR THE INFORMATION AND GUIDANCE OF ALL
SUBDIVIDERS, ENGINEERS, AND SURVEYORS
WITH REFERENCE TO THE
SUBDIVISION OF LAND WITHIN MISSION BAY PROJECT AREA
WITHIN THE CITY AND COUNTY OF SAN FRANCISCO
AND TO SUPPLEMENT THE MISSION BAY SUBDIVISION CODE

1998

BUREAU OF SUBDIVISION, SURVEYS & MAPPING
DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF SAN FRANCISCO

Adopted by Department of Public Works Order
No. _____, Approved _____

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I. PURPOSE

These regulations are established pursuant to Section 1411 of the Mission Bay Subdivision Code (the "MB Subdivision Code") adopted relative to the development of property in the Mission Bay North and South Redevelopment Areas (the "Mission Bay Project Area" or "Project Area"). These Regulations are intended to supplement said MB Subdivision Code and the Mission Bay North and Mission Bay South Redevelopment Plans (the "Plans") and the Plan Documents adopted in connection therewith, including the Design for Development and the Scope of Development, Infrastructure Plans and the other attachments to the owner participation agreements adopted by the Agency (individually and collectively the "Plan Documents").

All capitalized words used in these Subdivision Regulations shall have the meaning given to them in the MB Subdivision Code, the Plans and Plan Documents or specifically under these Subdivision Regulations.

II. APPLICABLE LAWS

Subdivision maps and all procedures in connection with the subdivision of land within the Mission Bay Project Area shall conform with all applicable laws of the State, the Plans and Plan Documents, including the MB Subdivision Code and applicable City Regulations, and all amendments thereto. In the event of any conflict between the applicable City Regulations, the MB Subdivision Code or these Regulations and the Plans and Plan Documents, the Plans and Plan Documents shall govern.

III. GENERAL PROCEDURE

The procedures described herein conform with the State laws and City Regulations applicable to subdivision development of the Mission Bay Project Area. They supersede all previous instructions issued by the Department of Public Works having to do with such

subdivisions. These Regulations supersede the Mission Bay Subdivision Regulations adopted on October 18, 1991, which have been repealed.

A. TENTATIVE MAPS

The Plans and Plan Documents contemplate that Tentative Maps for Major Phases, as defined in the Plans and Plan Documents, will be submitted as part of the subdivision process for the Mission Bay Project Area. Such initial Tentative Maps shall generally be comprised of one or more of the numbered Parcels, and portions thereof, shown on the Site Plans identified in the Plans and Plan Documents. Initial Tentative Maps may be filed for Major Phases or may precede Major Phase Approvals and may include different property from Major Phases. Subsequent or Project level Tentative Maps may be submitted and processed either concurrently or after the initial Tentative Maps.

The Mission Bay Subdivision Code permits and sets forth the procedure for the approval of Final Maps which are in compliance with Tentative Maps, but which show only a portion of a Tentative Map.

References in these Regulations to Tentative Maps shall include Vesting Tentative Maps, including all conditions of approval of such Tentative Maps, unless the text specifically provides otherwise.

B. SUBMISSION OF TENTATIVE MAP

The initial official act to obtain the approval of a subdivision is the formal submission of a Tentative Map Application Packet to the Director of Public Works, who is the designated Advisory Agency for the City and County of San Francisco. The Advisory Agency will determine whether the Application Packet for a Tentative Map is complete and notify the Subdivider within thirty (30) days following the date of submittal of the Application Packet. If

the Advisory Agency determines that the Application Packet is not complete, the notice to the Subdivider shall list all of the information necessary to comprise a complete application. The Tentative Map Application Packet will not be accepted for filing until the Advisory Agency determines that all required information is provided. Such Tentative Map shall be submitted by either a Registered Civil Engineer qualified to submit such Tentative Map or a Licensed Land Surveyor, and shall be accompanied by all of the documents required by the Mission Bay Subdivision Code which are to be included in the "Application Packet" as specified in Sections 1413(d), 1421 and 1422 of the MB Subdivision Code and amendments thereof, except as otherwise provided including with respect to Transfer Maps. The Subdivider shall submit ten (10) blue or black line prints or other mutually agreed upon format of each drawing of the Tentative Map and shall provide two (2) copies each of the required documents within the Application Packet. The Director of Public Works will submit a copy of the Tentative Map to the Department of Planning, the Port of San Francisco, the City Attorney, the Agency and other appropriate governmental agencies for review and recommendations. The number of copies of documents submitted in the application package will be identified by the Department of Public Works.

C. REVIEW BY THE DEPARTMENT OF PLANNING

All proposed subdivisions shall be reviewed by the Department of Planning for consistency with the San Francisco General Plan (the "General Plan"). Under certain circumstances, a variance may be granted to allow certain minor discrepancies with the General Plan. In order to be informed of the various policies of the General Plan applicable to a particular subdivision, it is suggested that the Subdivider consult with the Department of Planning in case of any uncertainties.

D. PUBLIC NOTICES

Whenever required under Section 1413 of the MB Subdivision Code, the Subdivider shall submit the following materials with the Application Packet:

(a) 300-foot radius map: A map drawn on tracing paper showing the property that is the subject of this application and all other property within a radius of 300 feet of the exterior boundaries of the subject property, the Assessor's block number on each block and Assessor's lot number on each lot, and the names of all streets shown. The map scale shall be 1"=50' unless another scale is approved in advance by the City Planning Dept. Maps of individual blocks may be traced at the Assessor's Office, and street widths may be obtained at the City Engineer's Office, however, it is advisable that this work be done by an experienced draftsperson.

(b) Address List: A typewritten list, showing in numerical order by Assessor's block and lot the names, addresses and zip codes of the last known owners of all properties within the 300-foot radius of the subdivision shown on the map. The names and addresses are available to the public at the Tax Collector's Office and are shown on the latest city-wide assessment roll. The list shall also include the names of the residents within the subdivision itself. The Subdivider should, in addition, include on the list the names and addresses of the person, organizations or any other agencies whom or which the Subdivider wishes to be notified of the hearing.

(c) Mailing Envelopes: One set of self-addressed and stamped (First Class Mail) envelopes addressed to each of the property owners included on the address list, and envelopes addressed to such other persons and agencies that the Subdivider wishes to notify, for notifying property owners involved and other interested parties of the date, time and place of the public hearing to be held.

E. ACTION ON TENTATIVE MAP

If the Director of Public Works is required to hold a public hearing on a Tentative Map application pursuant to the SMA or the MB Subdivision Code, then the Subdivider shall submit three (3) sets of mailing envelopes as described in subsection (c) above.

Within fifty (50) days after the receipt of a complete Tentative Map, unless such time shall have been extended by mutual agreement, the Director of Public Works shall determine whether it is in conformity with the provisions of the Subdivision Map Act, the Plans and Plan

Documents and any applicable City Regulations and shall approve, conditionally approve or disapprove said Tentative Map. The Director shall notify the Subdivider of the Director's findings and decision with regard to said Tentative Map.

The fifty (50) day period specified above shall not commence until after a complete Application Packet has been accepted for filing.

F. SUBMISSION OF FINAL MAPS

Within thirty-six (36) months after the approval or conditional approval of a Tentative Map, or such extended term as may be approved or applicable in accordance with Government Code Section 66452.6(a), the Subdivider may cause the subdivision or any part thereof to be surveyed and a Final Map or Parcel Map to be prepared in accordance with the Tentative Map as approved, and submitted to the Advisory Agency for formal approval.

G. ACTION ON FINAL MAP

Any Final Map or Parcel Map of a subdivision where street dedication is involved, and any Final Map of a condominium subdivision involving more than four units, shall be approved by the Board of Supervisors. After such Final Map has been approved by said Board, the Final Map shall be recorded in the County Recorder's Office, accompanied by a title guarantee for recording in accordance with the Subdivision Map Act.

IV. TENTATIVE MAP REQUIREMENTS

A. GENERAL

The Tentative Map shall be neatly and accurately drawn at a scale sufficiently large to present the required information clearly and accurately. All lettering and numerals on the drawings shall be legible from the bottom or right-hand side. In general, a Tentative Map shall include the information required in Section 1422 of the MB Subdivision Code. The Advisory

Agency may, however, in accordance with the MB Subdivision Code, authorize deletion or reduction of any Tentative Map application requirements not mandated by the Subdivision Map Act on the determination that the Tentative Map contains sufficient information to be evaluated adequately and preparing it in the prescribed form would impose a hardship upon the Subdivider and may delete, reduce or defer application requirements with respect to Transfer Maps. A Tentative Map application shall in general contain all the following information regarding the proposed subdivision consistent with the Plans and Plan Documents and the existing conditions. The Advisory Agency shall have discretion in deferring any of the following items until said Tentative Map has been conditionally approved:

1. The name of proposed subdivision.

2. North point (normally pointing to the top or left side of map), scale of drawing, date of drawing, and submission number, i.e., first submission, second submission, etc.

3. The name and address of the Subdivider and of the qualified Registered Civil Engineer or Licensed Land Surveyor.

4. The boundary lines of the tract to be subdivided.

5. For the subject parcel and each adjoining property, provide Assessor's Block and Lot number, reference and provide a copy of vesting deed or, if superseded by recorded map, reference recorded map.

6. The location of all existing buildings within the subdivision and on adjacent land which may be affected by the proposed subdivision.

7. The location and names of all existing or proposed streets within or adjacent to the proposed subdivision, together with over-all widths of roadways and sidewalks. If street names have not been selected and approved by the Central Permit Bureau and Department of Public Works, identifying letters may be used. Typical cross-sections of each street, showing the width of the street, the width of official sidewalk area, and width of concrete sidewalk that will be actually constructed.

8. Location and widths of existing and proposed right-of-way or easements which are to be dedicated, including the locations and widths of railroad

rights-of-way, sewer or other easements, alleys and other important features, both existing and proposed, affecting the subdivision.

9. Location and dimensions of existing or planned sanitary sewers and storm drains or combined sewers, as applicable, consistent with the Plans and Plan Documents, water mains, culverts, including distances between manhole covers or other underground structures and facilities within the tract, and direction of flow of said facilities and any and all easements.

10. Location of all other existing or planned utility facilities which would serve the proposed subdivision, including electric, gas, potable water, non-potable water if required, telephone, cable TV, etc.

11. All parcels of land proposed to be dedicated for public use, together with the purposes, conditions, and limitations, if any.

12. Location, dimensions and approximate size of blocks or lots, as applicable.

13. Topographical Map. Contours will be shown. Existing and proposed spot elevations may be used on flat sites.

14. Location and dripline of all existing trees with a diameter larger than 6 inches measured 36 inches above the adjacent ground within the proposed subdivision.

15. Layout of the street lighting and facilities for the fire alarm and police communication system.

16. Such other information as necessary to show conformity between the proposed subdivision and the General Plan.

17. Evidence that environmental evaluation of the project, if required by the California Environmental Quality Act (CEQA, Public Resources Code Section 21000 et seq.) is complete, or evidence that the Office of Environmental Review has determined that the project is exempt from CEQA.

18. A statement of intent as to whether the Subdivider intends to file multiple final maps.

19. A statement indicating that the application is subject to the applicable Mission Bay Redevelopment Plan.

20. Section 1422(b)(1) of the Mission Bay Subdivision Code provides that a preliminary title report must be submitted with a Tentative Map application. If the preliminary title report does not identify either the City or the Subdivider as the owner of the property which is the subject of the

Tentative Map application, or if the applicant does not otherwise provide evidence of the consent of the property owner, then the Tentative Map may only be approved if a condition is imposed requiring the Subdivider to (1) exercise due diligence to establish the title to the property covered by the Tentative Map; (2) assume all risks associated with proceeding under the Tentative Map approval subject to that condition; (3) cooperate with the City in its efforts to identify and notify all persons entitled to due process notification under the Subdivision Map Act; and (4) waive any rights under SMA § 66462.5 that may arise with respect to the property for which title in the Subdivider or the City is not established at the time the Tentative Map is approved.

21. Preliminary Soil Report. Three (3) copies of a Preliminary Soil Report prepared by a civil engineer and/or engineering geologist registered in the State and based upon adequate borings and excavations, shall be submitted to the City Engineer for subdivisions of five (5) or more parcels. The Director may require that such reports be submitted for subdivisions of four (4) or less parcels.

A Preliminary Soil Report may be waived by the City Engineer provided the City Engineer finds that, due to the knowledge the City has as to the soil and geologic conditions in the subdivision, no preliminary analysis is necessary. Such knowledge would include the nature, distribution, and strength of the existing soils, and the necessary grading procedures and design criteria for corrective measures, and the geology of the site and the effect of geological conditions on the proposed development.

If the City has knowledge of, or the Preliminary Soil Report indicates the presence of soil or geologic conditions which, if corrective measures are not taken, could lead to structural defects, a soils and/or geologic investigation of each lot in the subdivision may be required by the City Engineer prior to construction. Such soils and/or geologic investigation shall be done by a civil engineer and/or geologist registered in the State who shall recommend various corrective actions which are likely to prevent structural damage to the type of structures proposed to be constructed in the area where the soil problem exists. The City may approve the subdivision, or portion thereof, where soils or geologic problems exist if it determines that the recommended action is likely to prevent structural damage to the structures to be constructed. A condition of the issuance of any building permit may require that the approved recommended action be incorporated in the grading plans and/or specifications and, if necessary, the plans and specifications for the construction of each structure.

Where a Preliminary Soil Report is prepared, final reports shall be submitted prior to the acceptance of the improvements or the release of occupancy permits indicating the specific actions taken pursuant to the preliminary report recommendations. Such reports shall be certified by an engineer registered in the State of California to be in full compliance with the preliminary or subsequent progress report recommendations as they were applied to specific areas or improvements.

Preliminary Soil Reports must also comply with applicable Subdivision Regulations, City administrative policies and standards.

The information required in the Preliminary Soil Report prior to approval of an initial Tentative Map may be at a general level of detail, provided that more specific information may be required prior to approval of subsequent or project level maps. The Preliminary Soil Report shall contain the following elements:

The geologic and soil conditions within and immediately adjacent to the subdivision;

Indication and delineation of critically expansive soils or other soil problems which, if not corrected, may lead to defects in structures, buildings and other improvements;

Report on the suitability of the earth material for the construction of stable embankments and excavation slopes, together with recommended construction procedures needed to obtain the required stability; and

Report on slides, springs and seepage conditions, faults and erosion problems, together with recommendations for correction of any problems or hazards presented by such conditions.

The Preliminary Soil Report need not contain information concerning chemical analysis of the soil.

The City Engineer shall send copies of the Preliminary Soil Report to DBI for evaluation.

V. STREET, STORM DRAIN, SANITARY SEWER AND COMBINED SEWER IMPROVEMENT PLANS AND INFORMATION

A. STREET IMPROVEMENT PLANS. Where new streets are to be constructed within a subdivision for dedication to the City for public use, the Improvement Plans provided in accordance with Article VII (Final Map) shall include:

1. Grading and street improvement plans, showing pavement design, proposed location of street lights, fire hydrants, traffic signals, and police and fire alarms, if any.

2. Contours shall be at intervals of five feet or less, depending on the topography. They shall be referenced to Mission Bay datum, which is equal to City datum + 100'. The City benchmarks used and elevations thereof shall be shown.

3. On all streets within or adjacent to the subdivision, the curb grades shall be designated in the manner indicated on Bureau of Engineering drawing L-7215.2. The distances between such grade points, and the rate of grade shall be shown on curb lines. The lengths of vertical curves shall be shown in the same way.

4. The location, size, and rate of grade of all proposed sanitary sewers, storm drains or combined sewers, elevations at catch basins and the elevations of manhole inverts and rims of manhole covers in plan and profile views.

5. Location of catchbasins and culverts.

6. Profiles of streets showing existing ground along both property lines and the center line. (See drawing L-7215.2.) At the discretion of the Director, the profile may show existing ground along the center line only. The horizontal scale of profiles shall be at least four times the vertical scale. The center line profile of a curved street shall be plotted continuously. Profiles shall show proposed grade line of curbs.

7. Typical cross-sections of each street, showing the width of the street, the width of official sidewalk area, and width of concrete sidewalk that will be actually constructed.

8. Location of monuments shall be shown on the plans. The number of monuments and their location shall be approved by the Department of Public Works.

B. STORM DRAIN, SANITARY SEWER AND COMBINED SEWER.

Where new Storm Drain, Sanitary Sewer and Combined Sewer are proposed to be constructed, the tentative Maps shall show the proposed combined sewer or separate sanitary sewer and storm drains in accordance with the Plans and Plan Documents. Improvement Plans submitted with Final Maps shall show the proposed system based on construction standards and design standards consistent with the Plans and Plan Documents as follows:

1. IMPROVEMENT PLANS AND SPECIFICATIONS

Improvement Plans and specifications for sewer and storm water work provided in accordance with Article VII (Final Map) shall conform to the construction standards applying to work performed by the City and to the design standards described hereinafter consistent with the Plans and Plan Documents.

a) Improvement Plans.

Improvement Plans shall show at least the following: Existing and future work shall be delineated and labeled accordingly.

(1) Abbreviations. Abbreviations where used shall be as follows:

V.C.P. - Vitrified Clay Pipe

R.C.P. - Reinforced Concrete Pipe

C.I.P. - Cast Iron Pipe

D.I.P. - Ductile Iron Pipe

C.M.P. - Corrugated Metal Pipe

S.S. - Side Sewer

M.H. - Manhole

D.M.H. - Drop Manhole

C.B. - Catchbasin

O.G. - Official Grade (See drawing L-7215.2)

Inv. - Invert (Flow Line)

D.I. - Drainage Inlet

HDPE - High Density Poly-Ethylene

(2) Drawings.

A general plan of the portion of the Project Area shown on the Tentative Map shall be submitted showing:

(i) Location, with reference to street lines of all existing and proposed manholes, catchbasins, culverts, or other drainage appurtenances within the limits of the work.

(ii) Location of Manholes.

(iii) Approximate location of side sewers and storm laterals with reference to lot lines, and proposed sizes. Provision of this information can be deferred at the discretion of the Director.

(iv) Official or proposed street grades and anticipated settlement.

(3) Profiles of all main sewers and storm drain lines shall be submitted showing:

(i) Existing and proposed lines, with sizes noted thereon, together with manholes, and such structures as tapers, junctions, overflows, and diversion weirs.

(ii) Invert elevations of all existing and proposed lines at manholes and at grade changes.

(iii) Rim elevations of all manholes.

(iv) Pavement surface line or ground line on the center line of lines.

(v) Stationing, including intersecting street lines.

(4) Standard Plans. Except as otherwise provided in the Plans or Plan Documents, all sewers, storm drains and appurtenances shall, wherever possible, be constructed in accordance with approved "Standard Sewer Plans," copies of which may be obtained on application to the Bureau of Engineering. Plan of special structures or systems not covered by any Standard Sewer Plan must receive the approval of the City Engineer unless included in the Plans or Plan Documents.

b) Specifications.

Sewer and storm drain specifications, typed on 8-1/2" x 11" paper, or other mutually agreed upon format, shall describe all requirements as to material and workmanship, and shall, except as otherwise provided in the Plans and Plan Documents, conform with the current Standard Specifications of the Bureau of Engineering, Department of Public Works, City and County of San Francisco, (the "Standard Specifications") which are on file in the City Engineer's Office. The Standard Specifications, or pertinent provisions thereof, may, for convenience, be incorporated into the Subdivision Specifications, or may be made a part thereof by reference. Except as otherwise provided in the Plan and Plan Documents, the provisions of the Standard Specifications shall constitute the minimum requirements.

The applicant shall deliver one set of reproducibles, and four sets of prints, and four sets of specifications to the Director of Public Works for review with the Improvement Plans. One set of approved plans and specifications will be returned to the applicant.

2. FINAL ACCEPTANCE OF SEWERS AND STORM DRAINS

Final acceptance of sewers and storm drains intended for public use may be contingent upon an interior television inspection provided by the City at the expense of the permittee.

Upon completion of the project, the permittee shall provide the City with a mylar copy and, if requested, microfilms or diskettes of the final record drawings. Microfilms shall be in accordance with the format utilized by the City. The films shall be delivered to the City for a permanent record.

3. SEWER, STORM OR AWSS EASEMENT

Where sewer, storm or AWSS easements are required for sewer, storm or fire protection facilities, they shall be granted to the City and County of San Francisco and shall be for the exclusive use of the sewer, storm or AWSS facilities. Unless otherwise specified in the Plans or Plan Documents or authorized by the Director, all easements shall be a minimum of fifteen (15) feet in width, five (5) feet to one side and ten (10) feet to the other side of the centerline of the sewer, storm or pipe. Easement grants shall follow the City's standard form which provides, in part, that the easement shall not be used for the erection of any structure, nor for any other purpose which will damage or interfere with the proper use, function, maintenance, repair or replacement of the sewer or storm appurtenances or AWSS facilities.

Fences may be constructed and maintained on the easement, but the City reserves the right of immediate access without any requirement for notification, clearance or permission.

For furthering beautification purposes, low shrubs may be planted in the easement, provided that their roots or underground growth shall not damage the sewer or storm appurtenances or AWSS facilities. No trees or tall plants shall be planted in the easement.

In all events, the City and County shall not be held liable for any damage to the plants or fences in the easement which may occur as a result of activity pursuant to the purpose of the easement.

VI. OTHER SUBDIVISION REQUIREMENTS

The Subdivider shall provide for the construction and installation of all public improvements proposed in the subdivision. The term "public improvements" shall mean all improvements required pursuant to Article 5 of the Mission Bay Subdivision Code, and any additional improvements as may be required for the benefit of the public, pursuant to the Subdivision Map Act, as a condition of approval of the Tentative Map consistent with the Plans and Plan Documents. Upon approval of the Tentative Map, the term "public improvements" shall mean all improvements required pursuant to the Tentative Map.

VII. FINAL MAP

A. GENERAL

At any time during the term of the Tentative Map, the Subdivider may have suitable surveys made on the ground and may then prepare and file the Final Map. Prior to filing the Final Map, the Subdivider shall (1) submit Improvement Plans for any required Public Improvements to the Director of Public Works for approval, as provided in Section 1446 of the MB Subdivision Code, and (2) comply with the provisions of Section 1460 of the Mission Bay Subdivision Code.

B. SURVEYS AND COMPUTATIONS

1. As a basis for the Final Map, a complete and accurate survey of the land to be subdivided shall be made by a Registered Civil Engineer or a Licensed Land Surveyor.

2. A traverse sheet, in a form approved by the City Engineer, giving bearings, distances, and coordinates, and showing the mathematical closure shall be furnished to the City Engineer for all parcels, easements, monument lines or other lines as deemed appropriate by the City Engineer. Two blue or black line prints of the subdivision shall be submitted with the traverse sheets for checking and approval.

3. The traverse of the exterior boundary and for each block of the subdivision, when computed from field measurements, must close within a limit of error of one foot in 50,000 feet of perimeter, before balancing of the survey is undertaken. A maximum error of closure of 0.003 feet may be required where conditions warrant.

4. All monuments, property lines, street and lane lines, and all easements or rights-of-way shall be tied to this survey.

C. DETAILS OF FINAL MAP

1. All Final Map submittals for recordation "shall be legibly drawn, printed, or reproduced by a process guaranteeing a permanent record in black on polyester base film (or other material specified by the Subdivision Map Act or other mutually agreed upon method allowed by the Subdivision Map Act). The Final Map must conform in general design with the approved Tentative Map. Affidavits, certificates and acknowledgments may be legibly stamped or printed on the map with opaque ink. The Subdivider shall file the polyester base film tracing of the Final Map with the Director of Public Works. The Subdivider shall submit for recording two blue or black line prints on mylar acceptable to the City Engineer with original signatures on each print.

2. The size of each sheet shall be 18 inches by 26 inches over-all, with a marginal line drawn completely around each sheet so as to leave a blank margin one inch in width. The blue or black line prints, when trimmed, must be 18 inches by 26 inches.

3. The scale of the map shall be shown. It must be large enough to show all details clearly. Sufficient sheets, including a key map, shall be used to accomplish this purpose. Each sheet shall show: a title, a north point, the number of the sheet, the total number of sheets comprising the set, its

relation to the adjoining sheets, the basis of the bearings used, and explanatory and descriptive notes.

4. The map shall show all survey and mathematical information and data necessary to locate all monuments and to locate and retrace any and all interior or exterior boundaries, including angles or bearings and distances for all straight lines. The radius, length and central angle of all curves shall be shown.

5. Each block and lot shall be numbered. The angles or bearings and length of each lot, block, and boundary line shall be shown on the Final Map or approved record of survey map, or approved Parcel Map, except that when bearings or lengths of lot lines in any series of lots are the same, such bearings or lengths may be omitted from each interior parallel lot line of such series. Each required bearing and length shall be shown in full and no ditto marks or other designation of repetition shall be used.

6. Each street shall be designated by the name which has been authorized by the Central Permit Bureau.

7. The locations of all monuments shall be shown.

8. A written statement listing the applicable conditions of the Tentative Map that must be satisfied prior to approval of the Final Map, and a brief explanation as to how that condition has been satisfied.

9. Any other pertinent information requested as necessary to permit review of the Final Map and to determine compliance with Tentative Map conditions.

10. A copy of an executed Improvement Agreement, if applicable, as provided in Section 1451 of the Mission Bay Subdivision Code.

The Final Map (or separate instrument) shall bear the following certificates or acknowledgments in accordance with the SMA or the Mission Bay Subdivision Code:

D. CERTIFICATES AND ACKNOWLEDGMENTS

1. A certificate, signed and acknowledged by all parties having any record title interest in the land subdivided, consenting to the preparation and recordation of the Final Map and an offer of dedication for public use of the streets and easements shown.

2. Notary's acknowledgment of signatures.

3. Approval of Director of Public Works as Advisory Agent.

4. Approval as to form by City Attorney.

5. Certificate of City Engineer.

6. Certificate of Registered Civil Engineer or Licensed Land Surveyor.

7. Certificate of Clerk of Board of Supervisors as to liens or taxes.

8. Certificate of Clerk of Board of Supervisors approving the map and accepting the dedications.

9. Recorder's Certificate.

10. Certificate of Improvement Agreement, where applicable, as provided in Section 1457 of the Mission Bay Subdivision Code.

11. Certificate of Approval of Multiple Final Maps, where applicable, as provided in Section 1457 of the Mission Bay Subdivision Code.

Recommended standard forms of the above certificates and acknowledgments are shown in Appendix A. The form of Certificates shall be in conformance with the SMA.

VIII. PARCEL MAP

A. GENERAL

Under certain circumstances as defined in the SMA and in the MB Subdivision Code, the Subdivider may, if he should so choose, prepare and file a Parcel Map rather than a Final Map. The Parcel Map shall show the exterior boundary of the subdivision, proposed street lines, and monuments. Lot lines, dimensions as well as block and lot numbers, shall also be shown. Where boundary lines of a lot are not at right angles to each other, area in square feet of such lot shall be shown.

Where there is existing building (or buildings), such building lines shall be shown on the map, with sufficient data to enable determination of percentage of area of the new lot occupied

by such existing building or buildings. Existing buildings on adjoining properties shall also be shown.

A Parcel Map filed for record shall meet the same requirements as specified above in details of Final Maps.

The Parcel Map shall conform to the requirements of Chapter 2, Article 3 of the SMA and of these Regulations. Prior to filing a Parcel Map, the Subdivider shall comply with Section 1460 of the Mission Bay Subdivision Code.

B. CERTIFICATES

The Parcel Map shall bear the following certificates or acknowledgments in accordance with the SMA or the MB Subdivision Code:

1. Certificate of Registered Civil Engineer or Licensed Land Surveyor.
2. Certificate of City Engineer.
3. A certificate signed and acknowledged by all parties having any record title interest in the real property subdivided, consenting to the preparation and recordation of the Parcel Map.
4. Notary's acknowledgment of signatures.
5. Recorder's Certificate.
6. If, pursuant to MB Subdivision Code Section 1351.1(b), an improvement agreement is required, then the Parcel Map shall also include a Certificate of Improvement Agreement in a form similar to that required under Subdivision Code Section 1457(a)(3) for Final Maps.
7. Requirements for the construction of offsite or onsite public improvements, dedication of rights-of-way or easements shall be noticed by certificate on the Parcel Map.

Recommended standard forms of the above certificates and acknowledgments are shown in Appendix A.

IX. [INTENTIONALLY OMITTED]

X. DEEDS, BONDS AND FILING FEES

A. PARCEL MAP

The preliminary Parcel Map shall be accompanied at the time of submittal by the following:

Checking and processing fee.

Preliminary title report or reports.

A final Parcel Map when submitted for filing shall be accompanied by the following:

1. The recording fee, and evidence that all fees required by the Mission Bay Subdivision Code have been paid.
2. Original tracing or tracings, unless subsequently waived.
3. Duplicate original on mylar, unless subsequently waived.
4. Title report or reports, updated to the date of recording.
5. Improvement security as provided in the Mission Bay Subdivision Code Section 1470, of an improvement agreement is required pursuant to Section 1451.1(b) of the Mission Bay Subdivision Code.

B. TENTATIVE MAP

A Tentative Map or Tentative Condominium Map shall be accompanied at the time of submittal by the following:

1. Checking and processing fee.
2. Preliminary title report or reports.
3. Application Packet and all required documents.

C. FINAL MAP

A Final Map or Final Condominium Map when submitted for filing shall be accompanied by the following:

1. If requested by the City, a deed to the street areas, pedestrian ways, and other property to be dedicated to public use transferring the title in fee to the City and County of San Francisco. A title report covering the parcels dedicated shall be furnished showing the parcels to be free and clear of all encumbrances.

2. If requested by the City, a deed conveying easements to the City and County of San Francisco for sewers, water lines and/or for any other purposes required by the City as shown on the Final Map. Such deed shall contain the regular conditions and restrictions shown in the City's standard form for easements.

3. A bond in an amount fixed by the City Engineer to cover cost of setting monuments at some future date after the Final Map has been filed. A similar bond may be required when filing a Parcel Map, unless the monuments have been set at the time the map is filed.

4. A fee, as required to cover the cost of recording.

5. A certified check payable to the City and County of San Francisco in the amount of current taxes or special assessments, as estimated by the Controller, shall be filed with and approved by the Board of Supervisors. Should the Subdivider so desire, he may, in lieu of the certified check, file with the Board of Supervisors a bond for twice the amount of such taxes or special assessments. Section 2192 of the State of California Revenue and Taxation Code states that taxes become a lien but not yet payable on the first Monday of March at noon preceding the fiscal year for which taxes are levied.

6. Evidence that all Public Improvements have been completed to the satisfaction of the City and County of San Francisco, or the Subdivider may enter into an Improvement Agreement, as provided in Section 1451 of the MB Subdivision Code, and provide security for improvements as provided in Article 8 of the MB Subdivision Code.

7. Original tracing or tracings, unless subsequently waived.

8. Duplicate original on polyester base film, unless subsequently waived.

XI. SETTING MONUMENTS

Standard City monuments shall be set in such positions that another engineer or surveyor may readily retrace the lines of the survey or subdivision. The number of monuments and their locations must be approved by the City Engineer. Monuments located in pavement areas shall not be placed until pavement has been constructed. If the Final Map or Parcel Map is filed before pavement have been constructed, a bond in an amount determined by the City Engineer shall be filed with the Department of Public Works guaranteeing that the monuments will be set within one (1) year. Monuments shall be as shown in the Public Improvement Report.

XII. RECOMMENDED DESIGN OF STREETS, BLOCKS, AND LOTS

The Plans and Plan Documents include the standards of design for the layout of streets, blocks, and lots in the Mission Bay Project Area, and Major Phase Tentative Maps and all subsequent Tentative and Final Maps shall conform thereto, except where unusual circumstances shall warrant exceptions.

The Plans and Plan Documents call for certain patterns and treatments of City streets which serve as guidelines in the development of any new streets as a part of a subdivision.

A. STREETS

The following shall be the design criteria governing the dimensions and grades of City streets. Where topography or conservation of land use overrides other factors a variance may be granted subject to approval by the Director of Public Works and, if required, the Board of Supervisors:

1. Main thoroughfares shall have a width as shown in the Mission Bay Plans and Plan Documents and, when approved, on Major Phase Tentative Maps consistent therewith.

2. Secondary streets, and minor streets with frontage on both sides, shall have a width as shown in the Plans and Plan Documents and, when approved, on the Major Phase Tentative Map.

3. Minor streets and lanes shall have a width as shown in the Plans and Plan Documents and, when approved in accordance therewith, on the Major Phase Tentative Maps.

4. Intersecting streets shall meet at right angles or as nearly so as practicable.

5. Street grades in excess of seventeen percent (17%) will not be approved except under unusual conditions. No gutter grade shall be less than 0.5%. On any pavement grade less than 1.0% concrete gutters shall be provided. All changes in street grades, the absolute value of the algebraic difference which exceeds 1.5%, shall be connected by vertical curves of approved length sufficient to provide safe stopping sight distances and good riding quality.

6. Surface Drainage

   a. On streets with flat grades, one or more intermediate low points along the gutter between intersections may be created. The curb height at these low points shall conform with City Standards. When this is not possible, any deviation from the standard curb height must be approved by the Director of Public Works.

   b. At low end cul-de-sacs and sumps, in addition to sewer drainage facilities, surface drainage in facilities in dedicated easements, or surface drainage in streets, shall be provided as relief of overflow to prevent flooding of adjoining property.

   c. Street right-of-ways and drainage channel cross-sections shall be designed to provide a transport channel for overland or surface flow in excess of the 5-year storm capacity of the sewer system. The channel capacity shall be the difference between the sewer capacity and the quantity of runoff generated by a 100-year storm as defined by the U.S. Weather Bureau or by City-furnished data, applied over the tributary area involved.

7. Street curb intersections shall be rounded by a curve having a minimum radius of fifteen (15) feet.

8. Curb ramps shall be provided at each curb return. Curb ramps shall be constructed according to City standard.

B. BLOCKS

1. Blocks shall be of the approximate length shown in the Plans and Plan Documents, and on the Major Phase Tentative Map, when approved.

2. Mid-block lanes and mid-block parks, if any, shall be shown in accordance with the Plans and Plan Documents.

Vehicular Pedestrian Lanes shall be provided in the locations shown in the Plans and Plan Documents.

Other mid-block lanes shall be provided in the block shown in the Plans. These lanes may be vehicular pedestrian lanes or pedestrian only lanes, shall be located near the midpoint of the block.

The grade of the Vehicular Pedestrian Lanes, mid-block lanes, and mid-block parks shall not exceed fifteen percent (15%) unless steps of an approved design are provided.

3. Block numbers must be approved by the Assessor's Office.

C. LOTS

1. Lot dimensions shall conform with the Plans and Plan Documents including, without limitation, the Design for Development.

2. The side lines of all lots shall be at right angles, or radial to the street line, insofar as practicable.

3. Setback lines shall be consistent with the provisions of the Plans and Plan Documents, and, to the extent consistent therewith, Article 9 of the Planning Code.

4. Lot numbers must be approved by the Assessor's Office.

D. STREET IMPROVEMENT REQUIRED

The Subdivider shall improve, or agree to improve, all streets, highways, or public ways which are a part of the subdivision. Such improvement shall include the necessary paving, curbs, sidewalks, catchbasins, manholes, sewers, cisterns, side sewers, culverts, storm drains, sanitary sewers and various utilities such as gas, electric, telephone, potable water, and a non-potable

water distribution system, fire and police protection alarm, lighting, and other improvements, as necessary. All street improvements shall be in accordance with the requirements of the Plans and Plan Documents and the Major Phase Tentative Maps, when approved in accordance therewith. All water supplies for fire protection and all alarm facilities shall be approved by the Fire Department and Department of Telecommunications. All street lighting facilities shall be approved by the Bureau of Light, Heat and Power. All potable water supply mains shall be in accordance with rules and regulations of the San Francisco Public Utilities Commission. All non-potable water supply mains shall be in accordance with rules and regulations of the San Francisco Public Utilities Commission and the San Francisco Department of Public Works.

E. RECOMMENDED DESIGN OF PAVEMENTS

Pavements and curbs shall be of the types and design hereinafter set forth and shall be constructed as specified in the Plans and Plan Documents and, where not inconsistent therewith, in the Standard Specifications of the Bureau of Engineering, Department of Public Works.

F. CURBS

Concrete curb or equivalent shall be provided adjacent to all pavements.

XIII. RECOMMENDED STANDARDS OF DESIGN FOR COMBINED SEWER SYSTEMS

A. GENERAL

Provision shall be made for the removal of sewage and storm water from each lot or parcel of land, and the storm water from all roads, streets, and sidewalks.

At all sumps or cul-de-sacs, in addition to normal sewer connections, surface drainage channels in dedicated easements or surface drainage in streets shall be provided as relief overflows to prevent flooding of adjoining property.

Wherever "Standard Plans" are specified in this Section XIII, it shall mean San Francisco Standard Plans, except where they have been modified or superseded by the Plans or Plan Documents.

B. SEWERS

1. Location - Except where MUNI or other physical constraints dictate, sewers shall be located in the center of streets and lanes, unless otherwise permitted by the PUC General Manager.

2. Depth and Cover - The minimum depth of sewers shall be six (6) feet, except in unusual cases, when approved by the PUC General Manager, in which event, the minimum depth of the sewers in street areas shall not be less than three (3) feet in areas with concrete base and four (4) feet in areas of aggregate base in order to distribute surface loads and to provide space for utility service facilities.

For sewers located in the rear of lots or in easements not subject to surface traffic, the minimum depth of the trench shall be four (4) feet. Surface drainage in these areas shall be so designed that natural soil erosion does not result in a build-up of soil covering the manhole castings. This may be accomplished by designing the casting to rise slightly above the surrounding surface.

Sewers shall be designed to flow under surcharged conditions and, in the event of storms that exceed the conduit design criteria, the surcharge may rise to the street for overland flow transport. In order to prevent backflow from the sewer main into improvements below street grade, gravity line from low basements to sewer mains should not be made. Back flow preventors should be installed in all properties below street grade. Installation of automatic sewage ejectors is advisable for such drainage.

3. Types and Sizes - Sewers six inches (6") to twenty-one inches (21") in diameter shall be vitrified clay pipe (VCP) (ASTM C-700 Extra Strength). Sewers twenty-four inches (24") to thirty-six inches (36") in diameter may be VCP (ASTM C-700 Extra Strength) with construction modifications, or reinforced concrete pipe subject to the approval of the Director. Sewers larger than thirty-six inches (36") in diameter may be monolithic reinforced concrete or reinforced concrete pipe subject to the approval of the PUC General Manager.

In addition to circular shapes, egg-shaped, basket-handled, or rectangular sections may be required for particular flow conditions.

Standard plans for most monolithic types of sewer sections are available. Alternative pipe material for specific purposes and situations will be considered by the PUC General Manager.

Joints - VCP sewers shall have bell and spigot joints with factory fabricated compression-type fittings (ASTM C-425). Reinforced concrete sewer pipe (RCP) shall have bell and spigot or other approved joints.

4. Alignment - All pipe sewers, VCP and RCP, shall generally be laid on straight lines and grades between manholes. Curved sewers will not be permitted. Monolithic concrete sewers may be laid on curves, provided the radius of curvature is made as large as practical and is not less than four (4) times the diameter of the sewer.

5. Encasement, Bedding, and Piling - All VCP sewers shall be placed on a crushed rock foundation. All VCP sewers on grades of thirty percent (30%) or greater shall be encased in reinforced concrete in accordance with Standard Plans, and concrete shall be placed against undisturbed ground.

6. Settlement - Pipelines will be designed to comply with the criteria herein both at the time of construction and after 100% of the predicted fifty (50) year settlement.

C. MANHOLES

Manholes shall be located preferably at intervals of three hundred (300) feet but not more than three hundred fifty (350) feet and shall be provided at every change in size, grade, or alignment, at all junctions of sewers (except side sewers), at ends of sewers, and where catchbasin culverts join pipe sewers. Manholes shall be placed at intervals approved by the PUC General Manager on sewers with curved horizontal alignment.

Manholes shall be constructed in accordance with Standard Plans unless otherwise approved by the PUC General Manager.

D. TAPERS AND JUNCTION STRUCTURES

Taper structures shall be provided where a concrete sewer changes in size or shape. Junction structures shall be provided where concrete sewers merge.

E. CULVERTS

Culverts shall be constructed of VCP ten inches (10") in diameter. Connections to VCP sewers, and concrete pipe having a diameter less than forty-two inches (42"), shall be made at manholes only and in accordance with Standard Plans. Connections to brick sewers which are 3' x 5' or larger and to monolithic concrete sewers or concrete pipe sewers, forty-two inches (42") or more in diameter, may be made directly into the sewer in accordance with Standard Plans and current City practice.

Culvert inverts shall generally be laid at a depth of three to four feet below pavement grade at the CB, with a fall towards the manhole or sewer of approximately twelve (12) inches, but in no case at a grade of less than two percent (2%).

F. CATCHBASINS

Catchbasins (CB) shall be provided at all low points and shall be so located in the gutter as to most effectively serve the adjacent drainage area.

CBs or Storm Water Inlets ("SWIs") shall be spaced not more than six hundred (600) feet apart. Closer spacing and additional CBs and SWIs* may be required to effectively drain the pavement. Multiple inlets shall be installed where required by the PUC General Manager.

Catchbasins and SWIs shall be constructed in accordance with Standard Plans.

G. SEWER CONNECTIONS

1. Y- and T-Branches of vitrified clay shall be installed on all VCP sewers in locations described under the "side sewers" Section of these Regulations to provide connections for side sewers. In general they shall be six inches (6") in diameter for residential districts, and eight inches (8") minimum in diameter for industrial and commercial districts.

H. SIDE SEWERS

Unless otherwise permitted by the PUC General Manager, side sewers shall be installed in conjunction with construction of the main sewer and shall be extended one (1) foot beyond the curb and shall be in accordance with the San Francisco Plumbing Code.

Side sewers shall be provided and spaced as herein described. They shall generally be six inches (6") in diameter for residential areas and eight inches (8") minimum in diameter for industrial and commercial areas, and shall be laid on a uniform grade upward from the main sewer to a point twelve inches (12") beyond the curb line. This grade shall in no case be less than 1/4 inch per foot.

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* If approved by the Director.

The upper end of the side sewer, at the curb, shall be of sufficient depth to provide adequate drainage for the property served and in no case shall the invert at the curb be less than four (4) feet below curb grade. Openings in the existing sewer shall be made with a sharp cutting tool, and an approved saddle of appropriate size shall be epoxied or strapped to the existing sewer. Side sewers shall be located at the lowest elevation of the frontage of the property.

Where the street is to be paved before lot improvements are made, side sewers must be constructed beyond the curb before the paving is started. The upper end of each side sewer not in service when the work is backfilled shall be closed with a vitrified clay stopper, marked with a redwood post, and marked with the letter "S" on the curb, all as specified in the Standard Specifications.

XIV. RECOMMENDED STANDARDS OF DESIGN FOR SEPARATE SANITARY SEWER SYSTEM

A. GENERAL

Provision shall be made for the removal of sewage from each lot or parcel of land.

Wherever "Standard Plans" are specified in this Section XIV, it shall mean San Francisco Standard Plans, except where they have been modified or superseded by the Plans or Plan Documents.

B. SANITARY SEWERS

1. Location - Sewers shall be located in the center of streets and lanes, unless otherwise permitted by the Director.

2. Depth and Cover - the minimum depth of sewers shall be two (2) feet.

Back flow preventors should be installed in all properties below street grade. Installation of automatic sewage ejectors is advisable for such drainage.

3. Types and Sizes - Sewers shall be High Density Polyethylene (HDPE) with SDR of 17, 8" diameter minimum up to 12" diameter. Larger diameter may only be used with approval of the PUC General Manager.

4. Alignment and Curves - All pipe lines, shall generally be laid on straight lines and grades between manholes.

Curved lines are not permitted.

5. Settlement - Pipelines will be designed to comply with the criteria herein both at the time of construction and after 100% of the predicted fifty (50) year settlement.

C. MANHOLES

Manholes shall be located preferably at intervals of three hundred (300) feet but not more than three hundred fifty (350) feet and shall be provided at every change in size, grade, or alignment, at all junctions of sewers (except side sewers) and at ends of sewers. Manholes shall be placed at intervals approved by the PUC General Manager on pipelines with curved horizontal alignment.

Manholes shall be constructed in accordance with Standard Plans unless otherwise approved by the PUC General Manager.

D. SANITARY SEWER CONNECTIONS

1. Y-and T-Branches shall be installed on all sewers in locations described under the "side sewers" Section of these Regulations to provide connections for side sewers. In general they shall be four inches (4") in diameter for residential districts, and six inches (6") minimum in diameter for industrial and commercial districts.

E. SIDE SEWERS

Unless otherwise permitted by the PUC General Manager, side sewers shall be installed in conjunction with construction of the main sanitary sewer and shall be extended one (1) foot beyond the curb in accordance with the San Francisco Plumbing Code.

Side sewers shall be provided and spaced as herein described. They shall generally be four inches (4") minimum in diameter for residential areas and six inches (6") minimum in diameter for industrial and commercial areas, and shall be laid on a uniform grade upward from the main sanitary sewer to a point twelve inches (12") beyond the curb line. This grade shall in no case be less that 1/4 inch per foot.

The upper end of the side sewer, at the curb, shall be of sufficient depth to provide adequate drainage for the property served an in no case shall the invert at the curb be less than two (2) feet below curb grade. Openings in the existing sewer shall be made with a sharp cutting tool, and an approved saddle of appropriate size shall be epoxied or strapped to the existing sewer. Side sewers shall be located at the lowest elevation of the frontage of the property.

Where the street is to be paved before lot improvements are made, side sewer must be constructed beyond the curb before the paving is started. The upper end of each side sewer not in service when the work is backfilled shall be closed with a stopper, marked with a redwood post, and market with the letter "S" on the curb.

XV. RECOMMENDED STANDARDS OF DESIGN FOR SEPARATE STORM DRAIN SYSTEM

A. GENERAL

General provision shall be made for the removal of storm water from each lot or parcel of land, and the storm water from all roads, streets, and sidewalks.

At all sumps or cul-de-sacs, in addition to normal stormdrain connections, surface drainage channels in dedicated easements or surface drainage in streets shall be provided as relief overflows to prevent flooding of adjoining property.

Wherever "Standard Plans" are specified in this Section XV, it shall mean San Francisco Standard Plans, except where they have been modified or superseded by the Plans or Plan Documents.

B. STORM DRAINS

1. Location - Storm drains shall typically be located in the center of streets except where MUNI or other physical constraints dictate or unless otherwise permitted by the Director.

2. Depth and Cover - the minimum depth of storm drains shall be not less than three (3) feet in areas of concrete base and four (4) feet in areas of aggregate base, except in unusual cases, when approved by the PUC General Manager, where additional support is provided over the pipe or reinforced or high strength pipe is used.

For storm drains located in the rear of lots or in easements not subject to surface traffic, these areas shall be so designed that natural soil erosion does not result in a build-up of soil covering the manhole castings. This may be accomplished by designing the casting to rise slightly above the surrounding surface.

Storm drains shall be designed to flow under surcharged conditions and, in the event of storms that exceed the conduit design criteria, the surcharge may rise to the street for overland flow transport. In order to prevent backflow from the stormdrain line into improvements below street grade, gravity line from low basements to storm drain lines should not be made. Back flow

preventors should be installed in all properties below street grade. Installation of automatic sewage ejectors is advisable for such drainage.

3. Types and Sizes - Storm drains shall be RCP, 12" diameter minimum.

In addition to circular shapes, egg-shaped basket-handled, or rectangular sections may be required for particular flow conditions.

Standard plans for most monolithic types of comparable to standards for sewer sections are available. Alternative pipe material for specific purposes and situations will be considered by the Director,

Joints - reinforced concrete storm drain pipe (RCP) shall have bell and spigot or other approved joints.

4. Alignment - All pipe lines shall generally be laid on straight lines and grades between manholes.

Curved lines will not be permitted.

5. Settlement - Pipelines will be designed to comply with the criteria herein both at the time of construction and after 100% of the predicted fifty (50) year settlement.

C. MANHOLES

Manholes shall be located preferably at intervals of three hundred (300) feet but not more than three hundred fifty (350) feet and shall be provided at every change in size, grade, or alignment, at all junctions of storm drains (except side drains), at ends of storm drains, and where storm water inlet culverts join storm drains.

Manholes shall be constructed in accordance with Standard Plans unless otherwise approved by the PUC General Manager.

D. TAPERS AND JUNCTION STRUCTURES

Taper structures shall be provided where a concrete pipelines changes in size or shape. Junction structures shall be provided where concrete pipeline merge.

E. CULVERTS

Connections to existing VCP sewers, and concrete pipe having a diameter less than forty-two inches (42"), shall be made at manholes only and in accordance with Standard Plans. Connections to brick sewers which are 3' x 5' or larger and to monolithic concrete sewers or concrete pipe sewers, forty-two inches (42") or more in diameter, may be made directly into the sewer in accordance with Standard Plans and current City practice.

Culvert inverts shall generally be laid at a depth of two feet below pavement grade at the CB or Storm Waste Inlets ("SWI"), with a fall towards the manhole or sewer of approximately twelve (12) inches, but in no case at a grade of less than two percent (2%).

F. STORM WATER INLETS

SWIs shall be provided at all low points and shall be so located in the gutter as to most effectively serve the adjacent drainage area.

SWIs without traps per standard plans L-3141 or A33,585 shall be spaced not more than six hundred (600) feet apart. Closer spacing and additional SWIs if approved by the PUC General Manager may be required to effectively drain the pavement. Multiple inlets shall be installed where required by the PUC General Manager.

SWIs if approved by the PUC General Manager shall be constructed in accordance with Standard Plans.

G. STORM DRAIN CONNECTIONS

1. Y-and T-Branches shall be installed on all stormdrains in locations described under the "side drains" Section of these Regulations to provide connections for side drains. In general they shall be eight inches (8") in diameter for residential districts, and six inches (6") minimum in diameter for industrial and commercial districts.

H. SIDE DRAINS

Unless otherwise permitted by the PUC General Manager, side drains shall be installed in conjunction with construction of the main storm drain and shall be extended beyond the curb.

Side drains shall be provided and spaced as herein described. They shall generally be eight inches (8") minimum in diameter for residential areas and eight inches (8") minimum in diameter for industrial and commercial areas, and shall be laid on a uniform grade upward from the main storm chain to a point twelve inches (12") beyond the curb line. This grade shall in no case be less that 1/4 inch per foot.

The upper end of the side drain, at the curb, shall be of sufficient depth to provide adequate drainage for the property served and in no case shall the invert at the curb be less than two (2) feet below curb grade. Openings in the existing sewer or storm sewer shall be made with a sharp cutting tool, and an approved saddle of appropriate size shall be epoxied or strapped to the existing sewer. Side drains shall be located at the lowest elevation of the frontage of the property.

Where the street is to be paved before lot improvements are made, side drains must be constructed beyond the curb before the paving is started. The upper end of each side storm drain not in service when the work is backfilled shall be closed with a stopper, marked with a redwood post, and market with the letter "SD" on the curb.

XVI. REQUIRED CAPACITY OF COMBINED SEWERS

A. DESIGN BASIS

Combined sewers shall have sufficient capacity, when flowing full or surcharged to carry the computed storm water runoff, based on the ultimate development of the area including the natural drainage from upstream areas. Flow for a storm frequency of up to five years will be carried in pipes. Flow for a storm of frequency greater than five years will be carried in streets or channels as overland flow.

In a combined sewer, sanitary flow and infiltration need not, in general, be included in computing sewer capacities. The ultimate sanitary flow shall be included, however, where a sanitary sewer diversion line, interceptor, or pump discharge enters a combined sewer.

B. MINIMUM SIZE

Main sewers shall be a minimum of twelve inches (12") in diameter unless otherwise permitted by the PUC General Manager.

C. VELOCITY AND INVERT LINING

Storm sewers shall be designed for a minimum velocity of two (2) feet per second when flowing full.

Combined sewers shall be designed for a minimum velocity of one and two (2) feet per second under average conditions and three (3) feet per second when surcharged.

The inverts of monolithic concrete sewers shall be lined with vitrified brick or other approved material when the velocity under maximum sanitary flow conditions equals or exceeds ten (10) feet per second (approximately twenty (20) feet per second flowing full).

D. HYDRAULIC CONSIDERATIONS

Sewer sizes shall be selected so that the hydraulic grade line shall, in general, be four (4) feet below the pavement or ground surface, and at no point less than two (2) feet.

The tidal elevation to be used in hydraulic computations, where applicable, shall be 97.5', Mission Bay datum. The design high tide shall be 98', Mission Bay datum.

In large sewers hydraulic losses in bends shall be considered where the velocity is seven (7) feet per second or more.

E. RUN-OFF

1. Rational Formula

Storm water run-off shall be computed by the Rational Formula, as herein described, or such other methods as may be determined by the PUC General Manager to be City practice.

Rational Formula: $Q = CIA$, where

Q = Quantity of Run-off in cubic feet per second.

A = Drainage Area, tributary to the point under consideration, in acres.

C = Coefficient of Run-off = Ratio of Run-off to Rainfall.

I = Rate or Intensity of Rainfall in inches per hour.

(= c.f.s. per Acre) for the duration of rainfall corresponding to time of concentration.

2. Rainfall Intensity (I), or rate, used in design shall be taken from the tabulation entitled "San Francisco Rainfall Rate Table 1941," Plan L-3903.4 dated February 1941, or subsequent revisions thereof, and is defined as a 5-year storm. The intensity, or rate, to be used at any point along the sewer line, shall be the intensity corresponding to the total time of concentration at that point.

3. Area - The total area tributary to the point under consideration shall be used in design.

4. Coefficient of Run-off (C) for any area depends upon the type of development, character of the soil, slope and general topography, and the proportion of the area occupied by improvements. The coefficient used in design shall be in accordance with the values shown in Table I below and shall be subject to the approval of the PUC General Manager.

5. Time of Concentration and Inlet time - Time of concentration at any given point is the time required for the run-off from the most remote point in the drainage area to reach that point, and is equal to the inlet time plus the time of flow in the sewer to the point under consideration.

Inlet time is the time required for the water from the most remote point of the drainage area to reach the uppermost inlet of the sewer system. The inlet times used in design shall be in accordance with the values shown in Table I below. For inlet times of less than five minutes, the intensity of 3.13 inches per hour shall be used.

Coefficients of run-off and inlet times for various types of districts are shown in the following table. For those districts that do not fit into any of the categories below, proposed coefficients with rationale shall be submitted to the Bureau of Engineering for review and approval.

TABLE I

COEFFICIENTS OF RUN-OFF AND INLET TIMES

Type of District	Range of Values Run-Off Coeff. "C"	Inlet Time in Minutes Slope 3% & Over	Slope Under 3%
Commercial	.80 to .96	3	5
Industrial	.60 to .90	3-5	4-6
Apts. & Flats	.60 to .80	3	5
Residential (Attached Homes)	.45 to .70	4	6
Residential (Detached Homes)	.40 to .65	5	7
Suburban	.25 to .35	6	10

F. SELECTION OF SEWER SIZES

Sewer sizes shall be computed by the Kutter, or the Manning, Formula. The values of the coefficient of roughness "n" to be used for different types of sewers shall be as indicated below in Table II but in no case less than 0.013.

TABLE II

COEFFICIENT OF ROUGHNESS "n"

Type of Sewer	Coefficient "n"
Vitrified Clay Pipe	.013
Monolithic Concrete	.013
Centrifugally cast concrete pipe	.012 - .013
Brick	.015
Corrugated Iron	.025

XVII. SANITARY FLOW CRITERIA FOR THE COMBINED SYSTEM IN THE CITY AND COUNTY OF SAN FRANCISCO — COMBINED SYSTEM

A. DESIGN BASIS

Sanitary or interceptor sewers shall be designed to carry the ultimate maximum sanitary flow plus infiltration computed as hereinafter described, Sewers twelve (12) inches to eighteen (18) inches in diameter shall have sufficient capacity to carry the computed design flow when running half full. Sewers larger than eighteen (18) inches shall have sufficient capacity to carry the computed flow when running 3/4 full.

B. MINIMUM SIZE

Sanitary main sewers shall be a minimum twelve (12) inches in diameter unless otherwise permitted by the PUC General Manager.

C. VELOCITY

The grade of sanitary sewers shall be such as to produce a minimum velocity of two (2) feet per second under average sanitary flow conditions and three (3) feet per second with surcharge.

D. DEPTH

Sanitary sewers shall be constructed at the minimum depths specified under "Recommended Standards of Design for Sewer Systems". (Section XII above.)

E. SELECTION OF SEWER SIZES

In determining sewer sizes the coefficient of roughness "n" to be used shall be as specified for various types of materials in Table II above.

F. QUANTITY OF FLOW

Where no water use records are available, the maximum ultimate sanitary flow to be used in design shall be computed on the basis of 180 gallons per capita per day or 0.278 cubic feet per second per 1000 population. This maximum flow is predicated on an average ultimate flow of 100 gallons per capita per day. Where it is known that the average ultimate flow exceeds or will exceed 100 gallons per capita per day, the maximum ultimate flow used in design shall be adjusted accordingly.

Areas which include large water users or industries which discharge large quantities of industrial wastes shall be given special consideration as to quantity and quality of sewerage.

Population - In the absence of actual census counts, or other data, population densities for purposes of ultimate sanitary flow computations shall be assumed, subject to the approval of the Director of Public Works.

XVIII. REQUIRED CAPACITY OF SEPARATED STORM DRAIN SYSTEM

A. DESIGN BASIS

Storm water drains shall have sufficient capacity, when flowing full or surcharged to carry the computed storm water runoff, based on the ultimate development of the area including the natural drainage from upstream areas. Flows for a storm frequency of up to five years will be carried in pipes. Storms of frequency greater than five years will be carried in the streets as overland flow. Infiltration into storm pipe, will be calculated at 0.0003 times the flow.

B. MINIMUM SIZE

Main storm lines shall be a minimum of twelve inches (12") in diameter unless otherwise permitted by the PUC General Manager.

C. INVERT LINING

There is no requirement for an invert lining.

D. HYDRAULIC CONSIDERATIONS

Pipe sizes shall be selected so that the hydraulic grade line shall, in general, be two (2) feet below the pavement or ground surface, and at no point less than one (1) foot.

The tidal elevation to be used in hydraulic computations, where applicable, shall be 97.5 feet Mission Bay datum. The design high tide shall be 98.0 feet, Mission Bay datum.

E. RUN-OFF

1. Rational Formula

Storm water run-off shall be computed by the Rational Formula, as herein described, or such other methods as may be determined by the Director to be City practice.

Rational Formula: Q=CIA, where

Q = Quantity of Run-off in cubic feet per second.

A = Drainage Area, tributary to the point under consideration, in acres.

C = Coefficient of Run-off = Ratio of Run-off to Rainfall.

I = Rate or Intensity of Rainfall in inches per hour.

(= c.f.s. per Acre) for the duration of rainfall corresponding to time of concentration.

2. Rainfall Intensity (I), or rate, used in design shall be taken from the tabulation entitled "San Francisco Rainfall Rate Table 1941," Plan L-3903.4 dated February 1941, or subsequent revisions thereof, and is defined as a 5-year storm. The intensity, or rate, to be used at any point along the sewer line, shall be the intensity corresponding to the total time of concentration at that point.

3. Area - The total area tributary to the point under consideration shall be used in design.

4. Coefficient of Run-off (C) for any area depends upon the type of development, character of the soil, slope and general topography, and the proportion of the area occupied by improvements. The coefficient used in design shall be in accordance with the values shown in Table I below and shall be subject to the approval of the PUC General Manager.

5. Time of Concentration and Inlet time - Time of concentration at any given points is the time required for the run-off from the most remote point in the drainage are a to reach that point, and is equal to the inlet time plus the time of flow in the storm drain to the point under consideration.

Inlet time is the time required for the water from the most remote point of the drainage area to reach the uppermost inlet of the storm drain system. The inlet times used in design shall be 25 minutes.

XIX. SEPARATED SANITARY SEWER FLOW CRITERIA IN THE CITY AND COUNTY OF SAN FRANCISCO

A. DESIGN BASIS

Sanitary or interceptor sewer shall be designed to carry the ultimate maximum sanitary flow.

B. MINIMUM SIZE

Sanitary main sewers shall be a minimum eight (8) inches in diameter unless otherwise permitted by the PUC General Manager.

C. VELOCITY

The grade of sanitary sewers shall be such as to produce a minimum velocity of two (2) feet per second under average sanitary flow conditions.

D. DEPTH

Sanitary sewers shall be constructed at the minimum depths of two (2) feet below ground.

E. SELECTION OF SEWER SIZES

In determining sewer sizes the coefficient of roughness "n" to be used shall be .013 for HDPE.

F. QUANTITY OF FLOW

Where no water use records are available, the maximum ultimate sanitary flow to be used in design shall be computed on the basis of 180 gallons per capita per day or 0.278 cubic feet per second per 1000 population. This maximum flow is predicated on an average ultimate flow of 100 gallons per capita per day. Where it is known that the average ultimate flow exceeds or will exceed 100 gallons per capita per day, the maximum ultimate flow used in design shall be adjusted accordingly.

Areas which include large water users or industries which discharge large quantities of industrial wastes shall be given special consideration as to quantity and quality of sewerage.

Population - In the absence of actual census counts, or other data, population densities for purposes of ultimate sanitary flow computations shall be assumed, subject to the approval of the PUC General Manager.

XX. [INTENTIONALLY OMITTED]

XXI. SEVERABILITY

If any section, subsection, sentence or provision of these Subdivision Regulations is ruled inconsistent with the provisions of other existing State or local statutes and declared void, such said section, subsection, sentence or provision shall not in any way invalidate or change any other portion or portions of these Subdivision Regulations.

XXII. EFFECTIVE DATE

The provisions of these Subdivision Regulations, as amended, shall become operative upon approval and adoption by the Director of Public Works.

APPENDIX A

THE FOLLOWING IS TO BE USED ON ALL PARCEL MAPS PER SMA 66450

CITY ENGINEER'S STATEMENT

I HEREBY STATE THAT I HAVE EXAMINED THIS MAP; THAT THE SUBDIVISION AS SHOWN IS SUBSTANTIALLY THE SAME AS IT APPEARED ON THE TENTATIVE MAP, IF REQUIRED, AND ANY APPROVED ALTERATION THEREOF; THAT ALL PROVISIONS OF THE CALIFORNIA SUBDIVISION MAP ACT AND ANY LOCAL ORDINANCES APPLICABLE AT THE TIME OF THE APPROVAL OF THE TENTATIVE MAP, IF REQUIRED, HAVE BEEN COMPLIED WITH; AND THAT I AM SATISFIED THIS MAP IS TECHNICALLY CORRECT.

CITY ENGINEER

DATE:_____ BY: _____

CHIEF SURVEYOR
CITY AND COUNTY OF SAN FRANCISCO

THE FOLLOWING IS TO BE USED ON ALL FINAL MAPS PER SMA 66442

CITY ENGINEER'S STATEMENT

I HEREBY STATE THAT I HAVE EXAMINED THIS MAP; THAT THE SUBDIVISION AS SHOWN IS SUBSTANTIALLY THE SAME AS IT APPEARED ON THE TENTATIVE MAP, AND ANY APPROVED ALTERATION THEREOF; THAT ALL PROVISIONS OF THE CALIFORNIA SUBDIVISION MAP ACT AND ANY LOCAL ORDINANCES APPLICABLE AT THE TIME OF THE APPROVAL OF THE TENTATIVE MAP HAVE BEEN COMPLIED WITH; AND THAT I AM SATISFIED THIS MAP IS TECHNICALLY CORRECT.

CITY ENGINEER

DATE:_____ BY: _____

CHIEF SURVEYOR
CITY AND COUNTY OF SAN FRANCISCO

NOTE:

ON FINAL MAPS ONLY INCLUDE THE APPROVAL SIGNATURES FOR THE DEPUTY CITY ATTORNEY, THE DIRECTOR OF PUBLIC WORKS APPROVING THE MAP BY DPW ORDER, BUT DO NOT INCLUDE THE CITY ENGINEER'S ATTEST: SIGNATURE BLOCK. THE OTHER STATEMENTS REMAIN THE SAME.